

## A Summary of the Flux-rope CDAW events

Nat Gopalswamy

In this paper, I summarize some of the results obtained during previous CDAW on the events selected for analysis. The events were selected based on the following criteria: 1. The events must be well observed in the interplanetary medium as shock-driving interplanetary coronal mass ejections (ICMEs), 2. The ICMEs should have corresponding CMEs near the Sun, observed in white-light coronal images, and 3. The heliographic coordinates of the solar sources must be within 15 degrees from the Sun Center. In all, 24 magnetic cloud (MC) events and 35 non-MC events were analyzed. Of the 35 non-MC events selected for analysis, it was possible to fit flux ropes to 31/35 events if different boundaries and multiple flux ropes are used. The four events without flux rope structure seem to be poor events (short duration, poor magnetic and plasma signatures). Coronal flux rope fitting suggests (at least for a subset) that non-MC events become non-central during propagation. It was also found that MCs have high charge states; half of the non-MC events also have high charge states. The direction parameter of CMEs seems to be high for MCs. All these results are consistent with the idea that all ICMEs may be flux ropes.